5.4 CHLORANTRANILIPROLE (230)

RESIDUE AND ANALYTICAL ASPECTS

Chlorantraniliprole is an insecticide that operates by a highly specific biochemical mode of action. It was first evaluated for residues and toxicological aspects by the 2008 JMPR. The 2008 JMPR established an ADI for chlorantraniliprole of 0–2 mg/kg bw and concluded that an ARfD was unnecessary.

The 2008 JMPR also recommended the following residue definition for Chlorantraniliprole:

Definition of the residue for compliance with the MRL and dietary risk assessment in plant and animal commodities: *Chlorantraniliprole*

The residue is fat-soluble.

Chlorantraniliprole was last evaluated in 2016 for additional maximum residue levels. At the Fiftieth Session of the CCPR (2018), chlorantraniliprole was listed for consideration of additional uses by the 2019 Extra JMPR. The Meeting received information on registered use patterns, supervised residue trials on beans, peas and oil palm with product labels from Malaysia and the USA.

Methods of analysis

The current Meeting received additional concurrent recovery information for the analysis of chlorantraniliprole in plant matrices.

A minor modification of method 13261, which was previously evaluated by the 2008 JMPR, was additionally tested for dry peas, oil palm fruits, kernels and kernel oil as well as for the palm fruit mesocarb and mesocarb oil. The method involves analysis by LC-MS/MS techniques and was successfully validated at a LOQ of 0.01 mg/kg for all matrices investigated.

Results of supervised residue trials on crops

The Meeting received supervised trial data for applications of chlorantraniliprole on dry beans and peas as well as on oil palms conducted in the USA and Malaysia, respectively.

Dry beans (except dry soya beans) and dry peas

Chlorantraniliprole is registered for use on legume vegetables (succulent and dried) in the USA with a maximum GAP involving two foliar sprays of 0.11 kg ai/ha each (3 day interval), a maximum seasonal rate of 0.23 kg ai/ha and a PHI of 1 day.

Corresponding supervised field trials conducted in the USA on dry beans and dry peas matching this GAP were submitted.

Residues of chlorantraniliprole in beans, dry were (n=5): 0.011, 0.013, 0.016, 0.025 and 0.051 mg/kg.

Residues of chlorantraniliprole in peas, dry were (n=5): 0.024, 0.036, 0.054, 0.056 and 0.18 mg/kg.

The Meeting noted that residues in both commodities are not significantly different, which was confirmed by the Mann-Whitney-U Test. Since dry beans and peas are both representative commodities for the sub-groups dry beans (VD 2065) and dry peas (VD 2066), the Meeting decided to combine the datasets for mutual support.

Combined residues of chlorantraniliprole in beans, dry and peas, dry were (n=10): 0.011, 0.013, 0.016, 0.024, 0.025, 0.036, 0.051, 0.054, 0.056 and 0.18 mg/kg.

The US GAP does not include treatment of soya beans, which are also covered in the Codex sub-groups dry beans (VD 2065). Therefore the Meeting decided to exclude soya beans from its recommendations.

The Meeting estimated a maximum residue level of 0.3 mg/kg and a STMR value of 0.0305 mg/kg for chlorantraniliprole in dry beans (VD 2065), except dry soya beans and in dry peas (VD 2066).

Palm fruit

Chlorantraniliprole is registered for use on oil palms in Malaysia with two foliar sprays of 0.03 kg ai/ha each (14 day interval) and a PHI of 1 day. Four corresponding supervised field trial conducted in Malaysia were submitted.

Residues of chlorantraniliprole in palm fruits were (n=4): 0.18, 0.19, 0.2, 0.38 mg/kg.

The Meeting estimated a maximum residue level of 0.8 mg/kg and a STMR value of 0.195 mg/kg for chlorantraniliprole in palm fruits.

Fate of residues during processing

The fate of chlorantraniliprole residues has been examined under conditions simulating commercial processing of oil palm fruits.

Estimated processing factors for the commodities considered at this Meeting are summarised below.

Raw commodity	Processed commodity	Chlorantraniliprole			
		Individual processing factors	Mean or best estimate processing factor	STMR-P in mg/kg	Maximum residue level in mg/kg
Oil palm fruit (STMR: 0.195 mg/kg, maximum residue level: 0.8 mg/kg)	Mesocarp oil (= Palm oil)	1.6, 1.9, 1.9, 3.1, 3.4, 3.8	2.6	0.507	2
	Kernel oil (=Palm kernel oil, crude)	<0.03, <0.04, <0.04, <0.05, <0.05, 0.11	<0.05	0.0098	Not necessary
	Kernel cake (=Palm, kernel meal)	<0.03, <0.04, <0.04, <0.05(3)	<0.04	0.0078	Not necessary

For palm oil, crude (=mesocarp oil) the Meeting estimated a maximum residue level of 2 mg/kg and a STMR-P of 0.507 mg/kg, based on a mean processing factor of 2.6.

For palm kernel oil and palm kernel cake the Meeting estimated STMR-P values of 0.0098 mg/kg and 0.0078 mg/kg, respectively. No specific maximum residue levels are required since no accumulation of residues was observed.

Residues in animal commodities

The Meeting recalculated the livestock dietary burden based on the uses considered by the current and previous Meetings on the basis of diets listed in the 2016 edition of the FAO Manual Appendix IX (OECD Feedstuff Table). The maximum and mean dietary burdens for cattle of up to 36 ppm and 18 ppm, respectively, calculated by the 2016 Meeting are not changed by the addition of dry beans, except soya bean and dry peas (Median: 0.0305 mg/kg); and palm kernel cake (Median-P: 0.0078 mg/kg). The Meeting confirms its previous recommendations for animal commodities.

RECOMMENDATIONS

On the basis of the data obtained from supervised trials, the Meeting concluded that the residue levels listed in Annex 1 are suitable for establishing maximum residue limits and for IEDI assessment.

Definition of the residue for compliance with the MRL and dietary risk assessment for plant and animal commodities: *Chlorantraniliprole*

The residue is fat-soluble.

DIETARY RISK ASSESSMENT

Long-term dietary exposure

The ADI for chlorantraniliprole is 0–2 mg/kg bw. The International Estimated Daily Intakes (IEDIs) for chlorantraniliprole were estimated for the 17 GEMS/Food Consumption Cluster Diets using the STMR or STMR-P values estimated by the JMPR. The results are shown in Annex 3 of the 2019 Extra JMPR Report.

The IEDIs ranged from 0–1% of the maximum ADI. The Meeting concluded that long-term dietary exposure to residues of chlorantraniliprole from uses considered by the JMPR is unlikely to present a public health concern.

Acute dietary exposure

The 2008 JMPR decided that an ARfD for chlorantraniliprole was unnecessary. The Meeting therefore concluded that the acute dietary exposure to residues of chlorantraniliprole from the uses considered is unlikely to present a public health concern.